# CLAIMS

What is claimed is:

1. A method for equalization in a communications system, the method comprising:

utilizing a block code based error correction scheme in a modulation system of the communication system; and

removing cursor inter-symbol interference within an error code correction word to make code word decision with minimum error power-based criteria in the block code based error correction scheme.

2. The method of claim 1 wherein removing cursor inter-symbol interference further comprises utilizing a decision feedback equalization filter to remove symbol interferences from previous error correction code words.

3. The method of claim 2 wherein removing cursor inter-symbol interference further comprises utilizing distortion filtering in the decision feedback equalization filter.

4. The method of claim 3 wherein utilizing distortion filtering further comprises inserting a matrix multiplication-based filter after a feed forward equalizer filter and a feedback filter in the modulation system for symbol interference from the symbols in previous error correction code words.

5. The method of claim 3 wherein removing cursor inter-symbol interference further comprises adding scalar terms for each error correction code word to a decision metric of a real part of a projection of the filtered symbols to the error correction code words.

6. A system for equalization in a communications system, the system comprising:

a modulation system utilizing a block code based error correction scheme; and

a feedback equalization filter provided within the modulation system for removing cursor inter-symbol interference within an error code correction word to make code word decision with minimum error power-based criteria in the block code based error correction scheme.

7. The system of claim 6 wherein the decision feedback equalization filter removes symbol interferences from previous error correction code words.

8. The system of claim 7 wherein the decision feedback equalization filter further comprises a distortion filter.

9. The system of claim 8 wherein the distortion filter further comprises a matrix multiplication-based filter inserted after a feed forward equalizer filter and a feedback filter for symbol interference from the symbols in previous error correction code words.

10. The system of claim 8 further comprising a decision metric for the decision feedback equalization filter, wherein scalar terms are added for each error correction code

word to the decision metric of a real part of a projection of the filtered symbols to the error

correction code words.

11. A method for equalization in a communications system, the method comprising:

performing block code based error correction during signal modulation in a

communications system; and

making code word decisions with minimum error power-based criteria during the

block code based error correction with a decision feedback equalization filter that removes

cursor inter-symbol interference within an error code correction word.

12. The method of claim 11 wherein making code word decisions further comprises

utilizing the decision feedback equalization filter to remove symbol interferences from

previous error correction code words.

13. The method of claim 12 wherein making code word decisions further comprises

utilizing a distortion filter in the decision feedback equalization filter.

14. The method of claim 13 further comprising inserting a matrix multiplication-

based filter after a feed forward equalizer filtering and a feedback filter for symbol

interference from the symbols in previous error correction code words for the distortion

filter.

15. The method of claim 13 further comprising utilizing a decision metric for the decision feedback equalization filter, wherein scalar terms are added for each error correction code word to the decision metric of a real part of a projection of the filtered symbols to the error correction code words.

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